

G.O. - Cleveland

District - Division - Subsidiary

Interoffice Correspondence
Environmental Control

Office

April 7, 1981

Mr. P.N. Wigton
1608-R

Attached is the report of particulate emission tests performed March 24-25, 1981 on four casts at the Chicago Blast Furnace Cast House with experimental covers in place.

The average particulate emission rate of the four casts was 13.6 lbs/hr. This is a reduction of about 60 percent from the 33.4 lbs/hr average of the compliance tests conducted in January 1981.

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307762

Attachment

LTV STEEL COMPANY
Chicago District
Blast Furnace Cast House Test

A particulate emission test was conducted on March 24 and 25, 1981 by General Office Environmental Control on the Chicago Blast Furnace Cast House.

The test procedure was the same as that used in January 1981 to demonstrate compliance with the applicable Illinois SIP.

Experimental changes were made in the operating practices for the March 24-25, 1981 test. On March 24 covers were placed over the iron and slag runners. On March 25 additional runners were placed over the iron trough. An improvement was made on the cover over the iron trough during the second cast tested on March 25, 1981.

The average particulate emission rate for the four casts tested on March 24-25, 1981 was 13.6 lbs/hr as compared to an average of 33.4 lbs/hr for the six casts tested in January 1981. Note in Table I-A the reduction in emission rate for the two casts tested on March 25, 1981 from that of the two tested on March 24, 1981.

A summary of the March 24-25, 1981 test results is contained in Table I-A. Supporting data which include particulate emission data and iron and slag chemistry data are contained in Table II-A and Table III-A. A data summary (Table I) of the January 1981 test is attached for purposes of comparison. A diagram of the covered portions of the iron trough, the iron runners, and the slag runners is also included.

April 6, 1981

TEL:EJP

TABLE I-A

LTV STEEL COMPANY
Chicago District
Blast Furnace Cast House

Summary of Test Results

Cast No.	3635	3636	3642	3643	Avg.
Date	3-24-81	3-24-81	3-25-81	3-25-81	
Cast Duration (hrs)	1.12	1.21	.97	1.54	
Flow Rate Leaving Cast House (dscfm)	129,200	143,000	99,000	128,200	
Process Wt. Iron & Slag (tons)	520	657	568	551	
Emission Rate (lbs/ton process wt.)	.039	.029	.020	.024	
Hourly Process Wt, Iron Slag (tons/hr)	464	542	587	358	
Emission Rate (lb/hr)	18.2	15.8	11.9	8.6	13.6
Allowable Emission Rate (lbs/hr)	66.2	67.9	68.8	61.9	66.2

TABLE II-A
LTV STEEL COMPANY
Chicago District
Blast Furnace Cast House

Particulate Emission Test Data

Cast No.	3635	3636	3642	3643
Date	3-24-81	3-24-81	3-25-81	3-25-81
Avg. Annulus Exit Velocity (ft/min)	487	539	451	492
Avg. Annulus Exit Temperature (°F)	124	124	130	127
Annulus Exit Moisture (%)	17	17	17	17
Annulus Exit (Barometric) Pressure (in.Hg)	30.22	30.22	30.14	30.14
Total Annulus Exit Flow Rate (dscfm)	129,200	143,000	99,000	128,200
Total Sample Volume (dscf)	2,292	2,483	2,036	3,311
Total Sample Wt. Collected (grams)	2.4236	2.0794	1.8465	1.6840
Particulate Concentration x 10 ⁶ (lbs/dscf)	2.43	1.85	2.00	1.12
Particulate Concentration (grains/dscf)	.016	.013	.014	.008

4-6-81

TABLE III-A
IRON AND SLAG CHEMISTRY DATA

Date	Cast No.	Iron Chemistry					Slag Chemistry										Temp. °F	
		Si	S	P	Mn	C	SiO ₂	Al ₂ O ₃	CaO	MgO	S	FeO	MnO	TiO ₂	K ₂ O	Calc.	Dip	
3-24-81	3635	2.26	.03	.057	.74	4.43	38.06	8.58	39.50	1.056	1.56	.64	.33	.34	.35	2721	2750	
3-24-81	3636	1.43	.02	.064	.62	4.25	36.81	8.74	40.63	1.049	1.60	.39	.40	.32	.63	2423	2690	
3-25-81	3642	1.02	.052	.064	.55	4.38	37.70	7.92	40.57	1.084	1.66	.40	.46	.35	.46	2405	2700	
3-25-81	3643	1.02	.037	.063	.55	4.33	38.14	7.21	49.70	1.119	1.77	.17	.36	.30	.33	2370	2650	

TABLE I

LTV STEEL COMPANY
Chicago District
Blast Furnace Cast House
Summary of Test Results

Cast No.	3214	3215	3216	3220	3221	3222	Avg.
Date	1-14-81	1-14-81	1-14-81	1-15-81	1-15-81	1-15-81	
Cast Duration (hrs)	0.46	0.98	0.87	1.15	0.59	0.96	
Flow Rate Leaving Cast House (dscfm)	148,500	84,300	127,900	109,600	126,400	115,100	
Process Wgt; Iron & Slag (tons)	247	418	608	700	377	480	
Emission Rate (lbs/ton process wgt)	0.046	0.059	0.048	0.055	0.032	0.125	
Hourly Process Wgt; Iron & Slag (tons/hr)	537	427	699	609	638	500	
Emission Rate (lb/hr)	24.7	25.1	33.8	33.5	20.7	62.5	33.4
Emission Rate Allowable (lb/hr)	67.8	64.5	70.7	69.2	69.7	67.0	68.2

Chicago District
Blast Furnace Cast House
Position of Covers During Particulate Emission Tests

